Claims

1. Electromechanical energy converter with a rotor (10), wherein
a stationary flat coil (11) is arranged concentrically about the rotation axis (4) of the rotor (10),
the region inside the axial projection zone of the inside diameter of the flat coil is defined as a core zone (12),
stationary permanent magnet elements (14) arranged with rotational symmetry and having an alternating pole orientation in axial, radial or axial-radial direction form a magnet ring (13),
magnet flux elements (21) are shaped as toothed elements (7),
the toothed elements, which are arranged with rotational symmetry and are separated from each other by toothed element gaps (8), form a soft-magnetic toothed element ring (6),
the number of the toothed elements (7) is identical to the number of the pole pairs of the magnet ring (13),
the toothed elements (7) and the permanent magnet elements (14) are uniformly distributed along the periphery,
the toothed element ring (6) is a component of the rotor (10),
at least one annular air gap (18) exists outside the core zone (12) between the magnet ring (13) and the toothed elements (7),
an annular air gap (17) disposed inside the core zone (12) is arranged axially between the rotor (10) and a stationary magnet flux element (21), and
the permanent magnet elements (14), the toothed elements (7) as well as additional magnetic flux elements (21) and at least two annular air gaps (17, 18) together form axially-radially oriented magnetic circuits (19), which extend axially-radially around the flat coil (11) through its coil center and surround the flat coil (11).

2. Electromechanical energy converter according to claim 1,
characterized in
that a stationary soft-magnetic magnetic flux element (21) includes a bearing function for the rotor (10).

3. Electromechanical energy converter according to claim 2,

characterized in
that a sliding layer (25) made from a hard material is disposed between the stationary soft-magnetic flux element (21) having the bearing function and the rotor (10).

4. Electromechanical energy converter according to one of the preceding claims, characterized in that the flat coil (11) comprises one or more single-plane helical coils, with a metal strip as a conducting material.

5. Electromechanical energy converter according to one of the preceding claims, characterized in that a common rotor (10) is used for two axially superimposed energy converters (29).

6. Electromechanical energy converter according to one of the preceding claims, characterized in that the geometric shape of the toothed elements (7) is designed for defining a preferred rotation direction of the energy converter (29).

7. Electromechanical energy converter according to one of the preceding claims, characterized in that the rotor (10) of the electromechanical energy converter (29) and the rotor (10) of an additional electromechanical energy converter (29) according to one of the preceding claims are coupled via a coupling gear wheel (30) or via a different forced coupling.

8. Electromechanical energy converter according to one of the preceding claims, characterized in that the toothed elements have a curved shape.